DEPARTMENT OF COMMERCE

BUREAU OF FISHERIES

Seattle, Washington.

November 16, 1929.

Subject: Annual report. Bristol Bay District.

Commissioner of Fisheries.
Washington, D. C.

The following report is a summary of the Bureau of Fisheries activities and investigations in the Bristol Bay District during the season of 1929. The writer and Mr. Dennis Winn. Agent of the Bureau of Fisheries for the Territory of Alaska was in the district during the period from May 23 to August 22, 1929. A copy of Mr. Winn's report relative to the escapement of salmon in, and tributary to Iliamna Lake is attached, which covers the escapement of salmon in this particular area and gives the date of our departure from the Bristol Bay District.

PATROL VESSEL "SCOTER"

Construction and repair work was completed on the patrol vessel "SCOTER" on the 30th day of April, 1929 at Seattle, Washington. At this time the vessel was loaded and ready for departure to Bristol Bay, Alaska for the season of 1929. The hull of the "SCOTER" is of the purse seine boat type, sixty five feet in length and fifteen feet in width. The vessel was completely rebuilt with the exception of the hull and a portion of the main deck. The upper structure and the interior from stem to stern was remodeled. The bulwarks, deck railing, masts, and rigging is new. In fact the only part of the "SCOTER" that is not new is the hull from the keel to the main deck. On the forward deck a modern type power driven anchor hoist replaced the hand power hoist. The vessel is equipped with a fifty horse-power, Frisco-Standard, three cylender, four cycle gasoline engine, which developes a speed of eight knots an hour. All tanks for gasoline, coal oil, lubricating oil, cold water, and hot water are new. The pilot house, galley, dining room, and toilet are on the main deck. Aft of the dining room there is a trunk cabin on which the life boats are carried. The forecastle has eight large bunks, clothes lockers, anchor chain locker, and ample built in drawers for storage purposes, also a modern wash bowl with hot and cold water. The vessel is heated with an Arcola hot water heating system thruout. The engine room is well proportioned and is large with ample room for all auxiliary machinery, batteries, tanks, Arcola furnace, and electric generators. The after cabin is well arranged and has two comfortable berths, wash bowl with hot and cold water, office desk with typewriter bracket, wireless telegraph equipment complete, clothes lockers, and six drawers built under the berths. Access to the storage lockers is thru the after cabin. Eight port lights in this cabin gives a good circulation of air and plenty of light. The SCOTER is well designed and constructed to meet the requirements of the work at Bristol Bay. The "SCOTER" performs nicely in a heavy sea and is easy to handle.

Description of Seattle after being rebuilt

TRANSPORTATION OF FIELD CREW:

The "SCOTER" left Seattle, Washington at 1-50 P. M. May 4th, 1929 and arrived at the ships anchorage in Kvichak Bay, Alaska at 9-35 A. M. May 23rd, 1929. The patrol vessel "CRANE" left Seattle, Washington May 6th, 1929 and arrived at the ships anchorage in Kvichak Bay, Alaska at 3-30 A. M. May 22nd, 1929. A list of the employees and the vessels on which they were transported to Bristol Bay, Alaska is a part of this report.

FIELD CREW:

The Bristol Bay Field crew consisted of thirty seven permanent seasonal employees and three part time employees. The men employed were, weir operators, patrol boat pilots, patrol boat engineers, pile driver operators, river guards, cooks and carpenters. One woman was employed as a cook at the marine ways for a short period. The crew of the patrol vessel "SCOTER" is included in the above figure. All of the employees were very satisfactory and took a great deal of interest in the work. A number of the employees are studying Fisheries at the University of Washington. Credit is due the entire field crew for services performed in carrying out the program outlined by Mr. Winn.

CAMP ESTABLISHED:

During the afternoon of May 23rd, 1929 all of the employees including the employees that were furnished transportation north on the steamer "VICTORIA" were taken to the Bureau marine ways on the flood tide where a temporary camp was established. During the period from May 23rd to May 29th the entire crew was busily engaged in making necessary repairs to power patrol boats, skiffs, scows, and other Bureau equipment.

SHIPMENT OF SUPPLIES AND EQUIPMENT:

All of the food supplies and some of the equipment was transported north on the patrol vessels, "CRANE" and "SCOTER" The shipment of gasoline, distilate, lubricating oil, lumber, skiffs, pot scow, and pile driver was transported north on cannery freighters and brought into the Naknek river from the ships anchorage. The crew at the marine ways unloaded the cannery scows and stored the lumber on the river bank. The fuel oil and lubricating oil was stored at the cannery owned and operated by the Pacific American Fisheries at Naknek. Lumber was purchased for the construction of a weir on the Naknek river and a residence at the marine ways. The lumber for the Naknek counting weir was immediately transported up the Naknek river. The lumber for the residence was stored at the site which had been selected. The floating equipment was anchored in the Naknek river opposite the marine ways.

PILE DRIVER:

The pile driver which was constructed at Seattle, Washington was brought into the Naknek river and anchored off the marine ways. Mr. Fred R. Lucas with his crew of the Kvichak weir began work at once, erecting the gin and installing the power unit. The driver is composed of a heavy constructed scow twenty feet wide and forty feet long. On this scow there is mounted a well balanced gin thirty two feet high with three landings. The power unit is an Erstad International Hoist and Gasoline Engine, with ample power to handle all work of the nature required at Bristol Bay. The hoist and engine is of heavy construction, well designed and complete in every detail.

PILE DRIVER. Cont'd.

The hammer weighs twenty two hundred pounds and in addition to this hammer a follower weighing one thousand pounds is used in driving piling. Excellent work was performed by the pile driver in the installation of the Kvichak weir. The piling was well driven and solid. The pile driver greatly assisted in the work of removing the Naknek weir. It was used in lifting the tripods and timbers of the weir from the river and later in hoisting the material to the top of the river bank for winter storage. The driver is built of Washington Fir, is well designed and constructed and will give good service for many years.

NAKNEK WEIR:

On the early morning flood tide, May 30th, the Naknek weir crew was transported up the Naknek river to a point approximately twenty six miles above the marine ways. A temporary camp was established and construction work started on the tent frames. Upon completion of the tent frames a permanent camp was established and preparations for the construction of the weir started. Actual construction work on the weir was started June 2nd and the weir was completed at 10-00 A. M. July 2nd. The weir at this point in the river is approximately eleven hundred and fifty feet wide, and consists of sixty five tripods that vary in height. Four by six inches timbers were used for the tripod legs, four by four timbers for the stringers and two and one-half by two and one-half inch material for the pickets. The weir was well constructed and very rigid. Seven gates, or tunnels were placed in the weir with an opening about ten inches in width and the full height of the tunnel. A portion of the weir was closed with wire netting which proved very unsatisfactory and gave some trouble owing to the Grass and Algae coming down the river. (See table of weir count attached.)

KVICHAK WEIR:

The Pile Driver, Pot Scow, Patrol boat No. 1, Supplies and equipment, together with the Kvichak weir crew were transported up the Kvichak river to the weir site, approximately seventy five miles from the marine ways by the "SCOTER" and patrol boat No. 7. The "SCOTER" accompanied the party to Carlisle from which point, patrol boats No. 1 and No. 7 completed transporting the equipment and men to the weir site. Construction work was started on the weir at once. The Bureau has a permanent frame building at this point. The weir although properly constructed and very complete in its design proved to be of the wrong type for this particular river. It was composed of piling, wire netting with web tunnels, and gates, but due to the tremendous amount of Grass and Algae in this river it was impossible to hold the weir with the result that construction work was discontinued before the weir was completed. The force of the river water against the mass of Algae on the wire netting raised the netting from the river bottom. Thousands of pounds of rocks were laced in web along the bottom of the wire netting. In places where the netting held, the river cut holes under the netting, which could not be prevented. Construction work on the weir was discontinued July 9th, and preparations were made to remove the weir at once. The piling was drawn and placed on the river bank. The wire netting that could be salvaged was brought to the marine ways. The operators on this weir are to be given a lot of credit for the work they performed. The weir was well designed and built, but could not function on account of the Algae. Algae is composed of such a fibrous growth, that short steel brushes had no effect on it, and it was impossible to keep the wire netting clear.

UGASHIK WEIR:

Patrol boats No. 8 and 6 were taken to Ugashik. The "SCOTER" transported the Ugashik weir and patrol crew together with all supplies and equipment to

UGASHIK WEIR. Cont'd.

the mouth of the Ugashik river on the 12th day of June. Construction work was started on the Ugashik weir on June 17th and completed in ten days. This weir is not as wide as the Kvichak and Naknek weirs and takes less time to install. Mr. McFadden has been stationed at this point for some time and has things well organized and takes every advantage of short cuts in weir construction. (See table of weir count attached.)

PATROL OF NUSHAGAK DISTRICT:

The Nushagak and Igushik patrol crew with patrol boat No. 3, and supplies were transported to Nushagak by the "SCOTER" on the 17th day of June. Mr. Eric Fenno in charge of the Nushagak District established the Igushik patrol and took charge of his district in the usual efficient manner. Mr. John E. Van Ogle was stationed at Igushik during the commercial season.

Patrol of Kvichak River:-

Patrol of the Kvichak River in the vicinity of Graveyard Point, Squaw Creek, and Koggiung was established on the 25th day of June. Elmer Quistorff acting as special warden with Ray H. Nichols as engineer on patrol boat No. 1.

PATROL OF NAKNEK RIVER:

Patrol of the lower limits of the Naknek River was established on the 24th day of June. Leslie L. Rice acting as special warden with Ray O. Nichols as engineer on patrol boat No. 2.

PATROL OF UGASHIK RIVER:

Patrol of the lower limits of the Ugashik River was established on the 22nd day of June. C. M. Hatton acting as special warden with Oscar Thorene as engineer on patrol boat No. 6.

PATROL OF EGEGIK RIVER:

Patrol of the lower limits of the Egegik River was established on the 19th day of June. Arthur Satterwhite acting as special warden with Clinton Gross as engineer on patrol boat No. 5.

PATROL OF THE IGUSHIK RIVER:

Patrol of the lower limits of the Igushik River was established on the 19th day of June. Mr. John E. Van Ogle acting as special warden. A skiff was used for this patrol.

COMMERCIAL FISHING SEASON:

The commercial fishing season opened at 6 A. M. June 25th, 1929 and closed at 6 P. M. July 20th, 1929. An average red salmon pack was obtained during the twenty three actual fishing days.

PATROL OF LOWER LIMIT:

Patrol of the lower limit line from Point Etolin to Middle Bluff on the eastern shore of Kvichak Bay was maintained by the Patrol boat "SCOTER" during the entire fishing season.

PATROL BOAT No. 7.

Patrol boat No. 7 was busily engaged attending to weir operations, patroling the entire Kvichak-Naknek fishing area, checking gill nets in regard to length and depth and on general duty pertaining to Bureau activities. Joe Paulsean acting as Captain with Bertel Johnson as engineer. The writer used this boat during the season and maintained a constant patrol during the commercial fishing season, as well as direct other Bureau activities. Mr. Winn used this boat and the "SCOTER" in supervising the seasons work at Bristol Bay.

RESULT OF PATROL DUTY:

An efficient patrol of all closed areas was maintained during the commercial fishing season, which resulted in a total of nineteen arrests and sixteen convictions for violations of the Bureau Regulations. Violations by cannery fisherman were presented to the United States Commissioner at Naknek in a spirit of good faith on the part of the Bureau employees, which was approved by the interested canneryman in every instance. The officials of the Department of Justice were somewhat lenient with the defendant fisherman. The Commissioner was a fellow fisherman and had just been appointed as Commissioner. His judgement in the amount of the fines in some cases were not consistant with his findings and fines in other cases. However the fisherman now understand that the Bureau intends to protect its interest in the salmon industry, and tho the fines in some instances were not large, they had the effect, which will prevent wilful violations of the regulations in the future. (See list of cases attached.)

RUNS OF SALMON:

While the pack compares favorably with that of average years, the escapement was not comparable in proportion. The weather condition throughout the season was favorable to the fisherman, although rough on occasions, but no loss of time was experienced from inclement weather conditions, while favorable numbers of fish were in the Bay.

The pack would indicate a better season than in 1924, but in our estimation the size of the salmon represented most of the increased pack the current year; although we would estimate more fish this year than in 1924, they were not here in the comparative numbers that the pack would indicate. The fish were the largest in the history of the Bay according to canners operating here for many years. We estimated from three quarters of a million to one million less fish taken at Nushagak in 1929 than in 1928 and about 14,000 more cases packed the current year than in the previous year. This condition prevailed over the entire district.

NUSHAGAK DISTRICT:

The red salmon run came in early; the fish making their first appearance in good numbers June 28th, and the run continued strong over Saturday and Sunday, and until and including July 8th. Then followed two days of light run. The run developed again on the 11th to a large proportion and continued good to and including the 14th, after which it tapered off to light numbers at the end of the commercial season.

KVICHAK-NAKNEK DISTRICT:

These two districts are closely associated and must be considered together. The runs of salmon were spasmodic, but never heavy. The early season pack was in

KVICHAK-NAKNEK DISTRICT:

excess of the previous year and all were much encouraged for prospects of a big season. On July 4th a good run set in along the west shore at the Gravel Spit and excellent catches were made by the fisherman on the flood tides of July 4th and 5th. Between the 5th and 12th, small or mediocre catches were the order. On the latter date a good run set in continuing over Sunday closed period. The run was spent July 16th and small numbers represented the catches from that date to the end of the season. There were but two good periods of run, each of short duration; escapements over the weekly closed periods were good, but not considered adequate for efficient seeding of the vast spawning areas represented in these districts, and in comparison with the commercial catch.

EGEGIK DISTRICT:

Indian set nets showed good small runs before opening of commercial season and fair schools in river when season opened which continued until June 29th when they slacked off to negligible numbers until July 12th, when a heavy run set in. Inclement weather at this time assisted the escapement as very few fisherman were out. This condition continued for about fofrty eight hours and large numbers passed up the river during that period. On July 16th the run dropped off to fair numbers which condition prevailed to the end of the season.

UGASHIK DISTRICT:

The run into the Ugashik River was negligible until June 25th, when a few fisherman made small catches. It increased slowly, a few fish per boat each day until July 2nd, when boats averaged about four hundred fish each. The catch then declined to small numbers until July 12th, when a fair run set in and fisherman who braved inclement weather averaged nine hundred to one thousand fish per boat. After that date a rapid decline occurred to negligible numbers at the end of the commercial season. At no time were there fish in encouraging numbers. The future of this stream appears discouraging.

ESCAPEMENT OF RED SALMON:

NUSHAGAK DISTRICT:

At Nushagak the run and escapement was good comparing favorably with other good years, but not as heavy as in 1928. The escapement was favored by the salmon running very heavy over each Sunday closed period during the commercial season with a consequent heavy escapement into the rivers.

KVICHAK DISTRICT:

The escapement into the Kvichak River which ascended into the Iliamna and Lake Clark spawning areas was fair, but not heavy or considered good. It was almost an exact duplication of 1924 as to numbers and streams inhabited. Practically all of the small streams along the north shore of Iliamna Lake were almost barren of fish, but the better spawning streams such as Kokhonak, Copper River, Newhalen and streams at lower end of Lake Clark were well seeded.

The Bureau representative who is stationed at Iliamna advised relative to his late fall inspection. On September 10th the salmon and trout disappeared from Iliamna River. On the 12th he made a trip to Kokhonak, Belinda, Tommy Point, and small streams along the north shore. All but Kokhonak Creek were practically barren of salmon. These streams had small early run with the exception of Kokhonak,

which contained satisfactory numbers and prospects. The run into this stream continued strong from the date of our previous inspection August 13th, and the run was still holding strong with good numbers yet in the lake at the mouth of the stream on September 12th.

NAKNEK DISTRICT:

The escapement into the Naknek River, we consider wholly inadequate for the needs of this district and the spawning possibilities of the Naknek series of lakes and their tributaries. The count thru the weir totaled 564,592 which represented all the heavy part of the run. The weir was installed to late to intercept the small early run which sets in before commercial fishing begins, due to the fact of our short period of preparation and necessity of building and installing horses. After the commercial season was over, or on July 30th, the water which was continually rising thru the season overflowed our racks with no possibility orappearance of relief, and therefore compelled us to remove the rack while there were yet salmon ascending. It was impossible to obatin a true count, but considering the actual count through all the heavy portion of the run was only 564,592, and only small numbers ascending before and after the weir was efficiently operating, we feel that by adding 185,408, bringing the grand total to 750,000 red salmon gives a most liberal estimate in addition to the known count. This is not in keeping with the commercial take and spawning possibilities which in our estimation should reach a minimum of two million red salmon escapement.

There was but one big day at the weir, July 8th, when five men counted thru 257,157 red salmon from daylight to dark. The next largest count was on July 13 when 66,740 were counted thru. All other coumts were small. (See table of weir count attached.)

EGEGIK DISTRICT:

With the escapement into Egegik River centering in the Becharof spawning region while not on a par with several previous years, closely resembled 1924 and was considered fair in comparison with the commercial catch, but not favorable with the available spawning area.

UGASHIK DISTRICT:

Ugashik was poor as to escapement and appears to be falling off each year as the weir counts which follow would indicate:

1926	---	787,000
1927	---	443,262
1928	---	202,966
1929	---	148,122

This would indicate a serious condition developing with but one good year in five and each cycle reducing the numbers to the vanishing point. It would be the most sensible plan in our estimation to close the entire river to all commercial fishing for a period of five years, in order to permit the runs to rehabilitate themselves.

RESIDENCE:

Construction work started on the residence at the marine ways on the 23rd day of June. Mr. Henry O. Farrell acting as carpenter foreman and S. J. Cavanaugh as assistant. On July 2nd, Claud Bushey was transferred from the Naknek weir to the marine ways as a helper for the above carpenters. The residence is a modern six room structure built of lumber with shingled roof and sides. A concrete chimney was built to reduce the danger of fire. The kitchen range and the heater in the living room is connected to this chimney. The plumbing consists of one bath tub, one corner wash bowl, one hot water boiler, and one low tank toilet, which were installed in the bath room. A kitchen sink was installed and the proper connections were made to the coil in the kitchen range. A wash bowl is to be installed in the office next season. Proper drainage was given all water pipes so that during the winter season the water can be shut off and the pipes thoroughly drained. The sewer pipe is composed of wood and coated with tar on its interior. A cess pool was dug approximately one hundred feet below the residence and lined with heavy timbers. Extra care was taken in the construction of the walls and floor in order to reduce the fuel consumption. The walls consist of one coat of shingles, one coat of shiplap, one coat of beaded ceiling and between which there is two layers of building paper. The first floor was laid with rough shiplap over which one layer of building paper was placed and then the regular flooring. Ample windows and doors were installed as well as a ventilating system from the foundation to the attic. The exterior is to be stained and the interior varnished and painted. The residence overlooks the Naknek river, is approximately forty feet above the surface of the river and removed a sufficient distance from the marine ways and mess house to insure safety in case of fire at the ways. The residence is well constructed and is modern and complete. Mr. Alf Christensen with his wife and little daughter will occupy the residence. Mr. Christensen is employed as the winter man at the ways and will attend to the painting of the residence and all necessary work that is to be done in connection with the Bureau's property and equipment. The residence is of the type most suitable to this country, was designed by Mr. Winn and built in accordance with his instructions. Detail of work was supervized by Mr. Winn during the construction of the residence, which was completed August 24th, 1929.

NATIVE REPORT. BRISTOL BAY. (Submitted October 30, 1929.)

The natives of Bristol Bay and the country tributary to Bristol Bay where villages are situated on the Ugashik, Egegik, Kvichak, Naknek, Nushagak, Wood River, and along the lakes at the head waters of the rivers are composed of different tribes of natives, namely the Kenai, Kodiak, Aleuts, and Eskimos together with the half casts and the quarter breeds, which are the offsprings of the white men. The natives hold to the belief that their tribe is superior to the other tribes and intermarriage is not permitted. They do not associate with each other in a tribal way, and tho this condition exists, it has caused no trouble among them. The native population is on a par with the past few years with the exception of a few Eskimo families that came down to Ugashik from the interior country and later migrated to Nushagak.

The homes of the breeds are much superior to the homes of the older generation of natives, while the homes of the squaw men who married girls from

the Orphange at Dillingham in some instances compare favorably with the homes of the white residents. The schools maintained by the Federal and Territorial Governments at Dillingham, Koggiung, Iliamna, Clarks Point, Ugashik, Egegik, and Naknek have done a great deal to improve the standard of living conditions among the younger generation of natives. The men are industrious and support their families by fishing, trapping, and working in the canneries during the commercial season. The woman attend to the home and curing salmon for food.

The older natives are more indolent and their homes are of the ordinary type, which are characteristic of the country. Some are of the small barabara type, some are constructed of lumber, or logs and poles with dirt and grass covered roofs. Native homes usually consist of one or two rooms with a small entrance which is protected by a wind break, or shed. The wind break serves as a smoke house and a storage shelter for their equipment of fishing gear, traps, and dog harness. They use but little furniture, if any, and cook over an open fire outside, or in the wind break. Their living conditions are of the simplest, as they are content with little, and never make very much preparation for the future. They are not accustomed to sanitation and live in very unhealthy surroundings.

Their main food supply is red salmon, although they purchase some articles of food at the trading posts, such as flour, sugar, tea, and just the bare necessities of a simular nature. Red salmon is entirely cured by the natives for winter food, as this specie of salmon constitutes the bulk of the fish in this section of the country. The men and woman catch the salmon in the rivers, or along the lake shores, but the work of curing the salmon is attended to by the woman. The salmon is split and hung on racks under a shed where it is dried and smoked, and later tied in bundles. Forty salmon constitute a bundle. They know that so many bundles will be required to last them thru the winter for their own use, and for dog feed. They will cure that amount of salmon, but if during the winter before they ran short, they will make no attempt to cure an additional amount for the coming winter. Salmon are plentiful and the natives have no trouble in taking any amount they require.

During the trapping season in the winter they operate a line of traps and catch mink, fox, lynx, and land otter. Last winter the fur was not very plentiful due to the number of trap lines operated in the country and a shortage of rabbits and ptarmigan. Many of the natives are employed in the canneries during the commercial season and some are employed as fisherman. The earnings from the canneries together with the money received for their fur constitutes a yearly income, which is sufficient to take care of their meager requirements.

The general health of the natives is not to be compared with other residents of Bristol Bay. They live in poorly ventilated houses, do not have the proper food to maintain a healthy body and during any epidemic of sickness there is always a number of deaths which could be avoided if they would improve their home conditions in a sanitary manner. Alcohol, which they produce from flour, sugar, and water tends to lower their vitality and makes them shiftless and adds a misery which is altogether unnecessary.

During the summer the natives travel the rivers and lakes with boats, but during the winter months they use dog teams. Salmon is cured for dog feed and for this purpose alone a great many salmon are taken from the rivers. Each dog receives one salmon daily throughout the year.

NATIVE REPORT. Cont'd.

The natives who inhabit the interior villages are employed as Reindeer herders. Some natives have small herds of their own and live entirely upon their earnings from the Reindeer and fur that they trap during the winter. The interior natives come from interior points to the fish villages on the rivers, put up their yearly supply of salmon and then return to their homes. The salmon is transported from the rivers to their caches and stored for the winter. The Reindeer industry is growing each year and a market for Reindeer meat is being established throughout the United States, which will be a great benefit to the interior natives.

It is hard to estimate the yearly earnings of the natives, as they receive pay for their services which are at intervals of employment during the canning season, for services as Reindeer herders, for sale of the fur they trap, and for bounty on predatory enemies of salmon.

During the 1929 session of the Territorial Legislature at Juneau, Alaska, $40,000.00 was appropriated for the purpose of removing barriers in salmon spawning streams caused by natural waterfalls or log jams, and for the purpose of destroying predatory enemies of salmon throughout Alaska. A certain sum was allotted to each district. In the Bristol Bay district a bounty of five cents each was offered on any predatory trout. The natives catch the trout, dry the tails and place them on a string of one hundred each. The tails are delivered to a Bureau of Fisheries representative who is provided with a blank form of affidavit by the Territorial Government. Payments are made to the natives for their trout tails by the Territorial Treasuer upon the affidavits being properly signed, as to their being a bona-fide resident of the Territory. Arrangements were made by Bureau officials with the owners of the various trading posts in the district whereby a resident could use predatory trout tails as cash in making purchases at the posts. This is a great help to the natives and creates more interest for the reason that they can get their money for the tails at once instead of having to wait for the checks from Juneau which would require at least six months as there is no winter mail service after the month of September. A string of one hundred trout tails represents five dollars. Under the agreement with the trader a native requiring some article of food or clothing, but needs to cut a hole in the ice on the river, catch the trout and present the tails to the trader in lieu of money for which he receives the full amount of the bounty paid by the Territorial Government. This arrangement was very satisfactory to the natives and they have taken a great interest in the work with the result that some good work is being done in destroying predatory enemies of salmon which will be a great benefit to the salmon industry.

From interviews with people living in the district, the general opinion is that a few hundred dollars yearly is all the natives require to maintain an average family during the year.

CLOSE OF SEASON:

At the close of the season the weirs were removed and the material stored on the banks of the rivers. The patrol boats, scows, skiffs, and pile driver were placed on the marine ways and prepared for winter storage. All equipment was carefully checked and repair parts listed. The entire crew with the exception of those that were sent south on the steamer "VICTORIA" after the close of the commercial season maintained camp at the marine ways until August 25th at which

time they were transported to Seattle, Washington on the patrol boats "SCOTER" and "CRANE" Mr. Winn and the writer left the marine ways with patrol boats No. 7 and 6 on August 11th and proceeded to the Iliamna Lake district for the purpose of stream survey, and to establish a representative of the Bureau of Fisheries at Iliamna Village for the winter. (See attached list of transportation of employees.)

TRANSPORTING SALMON BETWEEN DISTRICTS:

Our records of the 1929 season shows, that during the commercial season about two hundred and sixty five thousand red salmon were transported from the Nushagak River to the Naknek River by various companies who operate canneries in both areas. Some loss of salmon was experienced which we feel was partly due to these shipments. Numbers of whole salmon were noted floating just south of Libbyville and in the Naknek River. We were unable to trace the origin of former, but the Pacific American Fisheries Superintendent at Naknek voluntarily reported the loss by spoilage of about twenty thousand red salmon due to a break down of their main power unit in the cannery. The season was warm and fish would not keep fresh for any lengthy period, hence some of the salmon from Nushagak where weather interfered with the trip across were not in good condition on arrival at their destination, although possibly not spoiled.

It is our belief that salmon should not be transported from one district to another unless to relieve unforseen conjestions and to prevent spoilage. This year has shown, that where one area is good or fair, and the other area is poor, the companies represented in both areas will make a business of transporting salmon from the good area to the less fortunate area. If this policy is permitted the coming season where there is anticipated a very small run in the Kvichak-Naknek area and a fair run in the Nushagak area it will mean the depletion of the Nushagak area on a par with the Kvichak-Naknek area and no run of importance to represent that life cycle.

We desire that a detailed report should be made to a Bureau representative by companies that are compelled to transport salmon from one district to another in order to prevent spoilage, due to a conjestion of salmon at their canneries in any district. The report to be made as soon as possible after shipment is made. The report to contain the number of salmon transported, the cannery at which a conjestion existed, the cannery to which the salmon was transported, the date of conjestion, the reason for such conjestion, and the total number of hours the salmon were enroute from the tally scow or conjested cannery to the cannery where the salmon were packed.

The entire activities of the Bureau of Fisheries was carried on in a strict business like manner. Each employee performed the duties assigned to him with promptness and care.

All dealings with the cannery operators were handled in a fair and friendly way and with strict accordance to the Bureau regulations.

Many favors were extended to the Bureau employees during the season by the officials of the various canneries, which assisted us materially in carrying on our work, and which we greatly appreciated.

Respectfully submitted,

N. O. Hardy. Warden.

Juneau, Alaska.

September 2, 1929.

Subject: Inspection of Salmon Spawning Areas in and Tributary to Iliamna Lake, Season of 1929.

Commissioner of Fisheries.
Washington, D. C.

The following report deals only with red salmon and where the word native is used, it has reference only to Indians.

After the commercial season ended in Bristol Bay and plans were perfected for an early departure of the remainder of the Bristol Bay force for the States, the writer and Warden N. O. Hardy proceeded with the Bureau patrol boat No. 7 with patrol boat No. 6 in tow from Naknek to Iliamna Lake where salmon spawning areas were inspected, as in previous years, and comparative results with previous escapements attempted.

We left Naknek on the early morning flood tide August 11, reaching Koggiung on the ebb tide where we were compelled to wait for the next flood before proceeding up the river. We continued our journey on the evening flood and anchored over darkness at the lower end of Horse Shoe Bend. Again continued up river early the following morning.

The usual fish village, composed of native Reindeer herders, was established on the banks of the Kvichak River near the lake outlet. Very little could be learned from them at this time, as on a previous visit early in the season, they had at that time about all the fish they needed and were most enthusiastic over the heavy run then passing into the lake. On the occasion of our previous visit to this village, July 9, the writer noted a continual passage of salmon upstream on both sides of the river almost its entire length. This fish village is increasing in population slowly each year and a white man is establishing a small trading post here. The permanent winter quarters of the natives who establish here each summer are back on the tundra about three miles to which point their fish are transported as soon as cured. They had no idea as to the number of salmon cured, but it is safe to assume they required from eight to ten thousand.

We arrived at Belinda Creek in the afternoon and Hardy and self inspected the stream at this point.

The fish village formerly situated here at the stream mouth comprising several smoke houses, caches etc. was completely destroyed by early spring floods. All of the buildings and caches with the exception

of one cache was washed away and the stream mouth had moved down the lake shore about 150 feet.

We proceeded up the creek about three and one-half miles and although this stream has small possibilities and in previous years almost the entire ru run into this creek was taken by the natives for food, there was about six thousand red salmon in the stream spawning mostly in the first mile of water; above that there were but few good spawning places and consequently limited possibilities. The upper reaches of the stream are composed of large boulders, and hard bottom with swift water. The natives that formerly lived here established a fish village about five miles below Belinda Creek and are fishing along the lake shore at a location called the "Gravel Spit"

We proceeded in the evening to anchorage at Big Mountain. (Bay)

Left early the next morning for Kokhonak Creek. As we entered the creek, for protected anchorage, we noted several extremely large schools of red salmon in and around the mouth of the stream comprising many thousand. While good schools were noted for a considerable distance upstream, the schools became fewer and with less numbers in each school as we advanced. The fish were beginning to scatter over the spawning beds, but there was little spawning in comparison to the numbers noted in the stream. We continued on into the lake at the creek head. The water in the creek was considerably lower and fewer fish noted around the lake outlet than in former years. The spring creeks entering the lower end of the lake were examined and less than half of the number noted last year was seen. As good a check as possible was made on the main stream and including the spring creeks, we estimated about fifty thousand salmon were in the streams above the native village, which is situated near the mouth of the stream. The numbers were considerably less than last year above the village, nor were they equal to last year in number, in and around the stream mouth where we estimated the current year about seventy five thousand salmon were schooling and passing into the stream, making our estimate one hundred and twenty five thousand for the entire stream. This we fell will be exceeded by late arrivals as it appears to us from all the information we can gather that the red salmon are entering the streams later each year for the purpose of spawning. At the fish village there were four families and a total of twenty one people curing salmon for personal use and dog feed. These natives are Reindeer herders who have herds of Deer in the vicinity of their camps. They are establishing a permanent village on the lake shore about three miles east of Kokhonak Creek, where two traders are contemplating establishing trading posts. Their caches and racks appeared to contain about seven thousand cured salmon and they can secure easily any further number needed with hook, or a couple of fathoms of web.

We returned to the boat in the evening and proceeded to Copper River.

The following morning, August 14, we proceeded up the river in a small skiff and outboard motor, but had the misfortune to put our motor out of commission on the riffles about two miles up stream and were compelled to row and line the skiff the remainder of the distance inspected.

Good schools of reds were noted in the lower mile of the river and schools of good numbers were seen at every advantageous point along the river. The fish here, as at Kokhonak Creek appeared late in spawning preparations.

The escapement was on a par with a fair year only, but not considered adequate for the stream. We continued up stream about five miles and all indications were most favorable. It is felt that this stream and Kokhonak will function at a fair capacity basis. A close estimate was impossible due to water discoloration, but from the observations possible with a comparison to other years, we estimated about one hundred and fifty thousand salmon in the stream.

On August 15 we inspected an unnamed small stream at the head of Intricate Bay. This stream proved very sluggish and is the outlet for a lake about a mile or more in diameter. No fish were noted in the creek, or in the vicinity of the lake outlet. We journeyed up a small stream to the lake creek, and noted fair numbers for the creek possibilities in course of spawning. The creek is about thirty feet wide with about one foot depth of water with medium flow. About one mile up stream we encountered a perpendicular fall about twelve feet high over which no fish could pass.

We estimated there were about two thousand salmon in the stream in the last stages of spawning, which condition is unlike anything we have seen so far. We on to Iliamna Village where we arranged to have patrol boat No. 7 return to Naknek and we to finish the inspection on No. 6.

Early in the morning of August 16 we left Iliamna Village to inspect the streams along the north shore of the lake.

We visited streams in Pedro Bay, Knutson Bay, Chekok Bay and in fact; the streams heretofore harboring spawning salmon and all with the exception of Newhalen River and the vicinity of Roadhouse Portage were almost complete failures and people living near the poorer streams were preparing to go elsewhere for their winters supply for home use and dog feed. We traveled well up each stream with negligible results as to seeing salmon.

On August 17 we inspected Newhalen River in its lower reaches in the vicinity of numerous fish villages. Here we learned of a very heavy run extending over the entire season and were being taken on the date of our visit, in fair numbers by various families camped along both shores of the river for about one mile above its outlet into Lake Iliamna. Most of the natives had discontinued fishing as they had a sufficient supply for their winter use.

There were about a dozen native families here and from the appearance of their caches and smoke houses, we judged they had from twenty to twenty five thousand salmon cured, or in the course of curing.

The river was badly discolored from glacier water, so no estimate, or intelligent observation was possible and we were forced to rely on the information received from those people operating each year and interested in the district, for comparative results with former years.

These people claim from double to fives times the number of last year at this point.

We did not proceed into Lake Clark as from previous experiences we learned that nothing could be gained from such a trip at this time of the year, as fish do not reach the upper lake waters until very late and the waters in the lower reaches are too discolored for observation. We then returned to Iliamna Village.

On August 20 a trip was made up the Iliamna River for about twelve miles from the river mouth. This stream, like all other streams along the north shore, with the exception of Newhalen River, was practically a failure up to this time, and future possibilities appeared meager. However, we were advised that last year, long after our inspection, there was an enormous run of red salmon into this stream. In fact, we were told that live salmon were in the stream in January. The locals state that this was the first time that such a run occured here and that the water in the river was unfit for home use until after the spring floods. They report the largest run in their experience. There was no indication, on the date of our inspection this year, of any number of salmon in the lake in the vicinity of this stream, or along the north shore east of Roadhouse Portage, and no late run is anticipated. However, the Bureau has a representative stationed here through the winter and he will report any late runs, or unusual occurences through the fall and winter months covering those streams along the north shore, which now appear negligible to escapement.

In summarizing the escapement over the entire district, we fell it is almost a duplicate of 1924 when we reported a fair escapement and salmon were more numerous in the same localities as in that year with possibly a heavier run this year into Newhalen River and thence to Lake Clark district.

The commercial pack was slightly over that of 1924 in this district, although the total Bristol Bay pack exceeded that of 1924 by about twenty five percent, the gains being made in the Nushegak and Egegik districts with excellent escapements reported into these two areas.

In the Ugashik district the pack was on par with 1924, but the escapement was poor. From our observations in early July of salmon passing up the main river, we expected a greater distribution of salmon over the spawning beds. The escapements of consequence were spasmodic and the Iliamna spawning possibilities so enormous that there must be an exceptionally heavy escapement to make any appreciable showing on the beds.

After completing our observations over the lake and tributaries we proceeded over the portage from Iliamna Village to Iliamna Bay, thence via Bureau patrol boat TEAL to Anchorage and Alaska Railroad to Seward, thence via regular transportation boat to Juneau, where we arrived August 29.

Respectfully submitted,

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Agent.